

## CLAIMS

What is claimed is:

1. A method for creating a bundle of soft permanent virtual circuits (SPVCs) coupling from a source end to a destination end via a communications network, said method comprising:
  - creating an SPVC bundle for the source end, the SPVC bundle comprising a plurality of member SPVCs, each member SPVC comprising a permanent virtual circuit (PVC) and a switched virtual circuit (SVC), each of the member SPVCs being associated with a respective connection characteristic and coupling to a same destination; and
  - transmitting, from the source end to the destination end, an SPVC setup message containing configuration information of the SPVC bundle.
2. The method in accordance with claim 1, further comprising:
  - receiving parameters defining the SPVC bundle at the source end, the configuration information transmitted to the destination end corresponding to the parameters.
3. The method in accordance with claim 1, further comprising:
  - automatically creating, at the destination end, in response to the SPVC setup message, the SPVC bundle for the destination end in accordance with the configuration information.

4. The method in accordance with claim 1, wherein the respective connection characteristic comprises at least one of:
  - a quality of service (QoS) parameter; and
  - a traffic parameter.
5. The method in accordance with claim 1, wherein the configuration information comprises:
  - bundle-level parameters; and
  - parameters for individual member SPVCs.
6. The method in accordance with claim 5, wherein said bundle-level parameters comprises:
  - network service access point (NSAP) address;
  - encapsulation parameters; and
  - address map parameters.
7. The method in accordance with claim 5, wherein the parameters for individual member SPVCs comprise at least one of:
  - quality of service (QoS) parameters;
  - traffic parameters; and
  - VPI/VCI values.

8. The method in accordance with claim 7, wherein the parameters for individual member SPVCs further comprise at least one of:

Internet Protocol (IP) precedence levels; and

parameters specifying bumping rules.

9. The method in accordance with claim 1, further comprising:

associating each of the member SPVCs with a respective Internet Protocol (IP) precedence level.

10. The method in accordance with claim 1, wherein said transmitting comprising:

signaling the SPVC setup message containing the SPVC bundle information using the Generic Application Transport information element (GAT IE).

11. A method for creating, at a destination network device, a bundle of soft permanent virtual circuits (SPVCs) coupling form a source network device to the destination network device via a communications network, said method comprising:

receiving and decoding an SPVC setup message containing SPVC bundle information for creating an SPVC bundle coupled from a specified source end, the SPVC bundle comprising a plurality of member SPVCs, each of the member SPVC comprising a permanent virtual circuit (PVC) and a switched virtual circuit (SVC);

extracting parameters from the SPVC bundle information; and

creating the SPVC bundle based on the extracted parameters, each of the member SPVCs being associated with a respective connection characteristic and coupled from the specified source end.

12. The method in accordance with claim 11, wherein the parameters comprising:  
bundle-level parameters; and

parameters for individual member SPVCs.

13. The method in accordance with claim 12, wherein said bundle-level parameters comprises:

network service access point (NSAP) address;

encapsulation parameters; and

address map parameters.

14. The method in accordance with claim 12, wherein the parameters for individual member SPVCs comprise at least one of:

quality of service (QoS) parameters;

traffic parameters; and

VPI/VCI values.

15. The method in accordance with claim 14, wherein the parameters for individual member SPVCs further comprise at least one of:

Internet Protocol (IP) precedence levels; and

parameters specifying bumping rules.

16. The method in accordance with claim 11, wherein each of the member SPVCs is associated with an Internet Protocol (IP) precedence level.

17. The method in accordance with claim 11, wherein the SPVC setup message containing the SPVC bundle information is transmitted using the Generic Application Transport information element (GAT IE).

18. The method in accordance with claim 11, further comprising:  
allocating a PVC connection and an SVC connection on the destination network device for each member SPVC.

19. A network device for creating a bundle of soft permanent virtual circuits (SPVCs) coupling from a source end to a destination end via a communications network, said network device comprising:

an interface adapted to receive commands and parameters to create an SPVC bundle comprising a plurality of member SPVCs, each of the member SPVCs comprising a permanent virtual circuit (PVC) and a switched virtual circuit (SVC);

an SPVC bundle manager coupled to said interface, adapted to configure the SPVC bundle in accordance with the parameters, each of the member SPVCs being associated with a respective connection characteristic and coupling to a same destination;

an SPVC manager coupled to said SPVC bundle manager, adapted to create an SPVC bundle setup request and SPVC bundle information based on data received from said SPVC bundle manager; and

a signaling module coupled to said SPVC manager, adapted to encode and transmit an SPVC setup message containing the SPVC bundle information.

20. The network device in accordance with claim 19, wherein the SPVC bundle information comprises:

bundle-level parameters; and  
parameters for individual member SPVCs.

21. The network device in accordance with claim 20, wherein said bundle-level parameters comprises:

network service access point (NSAP) address;  
encapsulation parameters; and  
address map parameters.

22. The network device in accordance with claim 20, wherein the parameters for individual member SPVCs comprise at least one of:

quality of service (QoS) parameters;  
traffic parameters; and  
VPI/VCI values.

23. The network device in accordance with claim 22, wherein the parameters for individual member SPVCs further comprise at least one of:

Internet Protocol (IP) precedence levels; and

parameters specifying bumping rules.

24. The network device in accordance with claim 19, wherein said SPVC bundle manager is further adapted to associate each of the member SPVCs with a respective Internet Protocol (IP) precedence level.

25. The network device in accordance with claim 19, wherein said signaling module transmits the SPVC setup message containing the SPVC bundle information using the Generic Application Transport information element (GAT IE).

26. The network device in accordance with claim 19, further comprising:  
a connection manager coupled to said SPVC bundle manager, adapted to allocate a PVC connection and an SVC connection on said network device for each of the member SPVCs.

27. A network device for a destination end of a bundle of soft permanent virtual circuits (SPVCs) coupling form a source end to the destination end via a communications network, said network device comprising:

a signaling module adapted to receive and decode an SPVC setup message containing SPVC bundle information for creating an SPVC bundle coupled from a

specified source end, the SPVC bundle comprising a plurality of member SPVCs, each of the member SPVC comprising a permanent virtual circuit (PVC) and a switched virtual circuit (SVC); and

an SPVC bundle manager adapted to extract parameters from the SPVC bundle information and to create the SPVC bundle, each of the member SPVCs being associated with a respective connection characteristic and coupled from the specified source end.

28. The network device in accordance with claim 27, wherein the parameters comprising:

bundle-level parameters; and  
parameters for individual member SPVCs.

29. The network device in accordance with claim 28, wherein said bundle-level parameters comprises:

network service access point (NSAP) address;  
encapsulation parameters; and  
address map parameters.

30. The network device in accordance with claim 28, wherein the parameters for individual member SPVCs comprise at least one of:

quality of service (QoS) parameters;  
traffic parameters; and  
VPI/VCI values.

31. The network device in accordance with claim 30, wherein the parameters for individual member SPVCs further comprise at least one of:

Internet Protocol (IP) precedence levels; and

parameters specifying bumping rules.

32. The network device in accordance with claim 27, wherein each of the member SPVCs is associated with an Internet Protocol (IP) precedence level.

33. The network device in accordance with claim 27, wherein the SPVC setup message containing the SPVC bundle information is transmitted using the Generic Application Transport information element (GAT IE).

34. The network device in accordance with claim 27, further comprising:  
a connection manager coupled to said SPVC bundle manager, adapted to allocate a PVC connection and an SVC connection on said destination network device for each member SPVC.

35. A system for creating a bundle of soft permanent virtual circuits (SPVCs) coupling from a source end to a destination end via a communications network, said system comprising:

a source network device, comprising:

an interface adapted to receive commands and parameters to create an SPVC bundle comprising a plurality of member SPVCs, each of the member SPVC comprising a permanent virtual circuit (PVC) and a switched virtual circuit (SVC);

a first SPVC bundle manager coupled to said interface, adapted to configure an SPVC bundle to a specified destination bundle based on the parameters, each of the member SPVCs being associated with a respective connection characteristic and coupling to a same destination;

a first SPVC manager coupled to said first SPVC bundle manager, adapted to create an SPVC bundle setup request and SPVC bundle information based on data received from said first SPVC bundle manager; and

a first signaling module coupled to said first SPVC manager, adapted to encode and transmit an SPVC setup message containing the SPVC bundle information; and

a destination network device, comprising:

a second signaling module adapted to receive and decode the SPVC setup message containing the SPVC bundle information; and

a second SPVC bundle manager, adapted to extract parameters from the SPVC bundle information to configure the SPVC bundle and create the member SPVCs for the destination end.

36. The system in accordance with claim 35, wherein the SPVC bundle information comprising:

bundle-level parameters; and

parameters for individual member SPVCs.

37. The system in accordance with claim 36, wherein said bundle-level parameters comprises:

- network service access point (NSAP) address;
- encapsulation parameters; and
- address map parameters.

38. The system in accordance with claim 36, wherein the parameters for individual member SPVCs comprise at least one of:

- quality of service (QoS) parameters;
- traffic parameters; and
- VPI/VCI values.

39. The system in accordance with claim 38, wherein the parameters for individual member SPVCs further comprise at least one of:

- Internet Protocol (IP) precedence levels; and
- parameters specifying bumping rules.

40. The system in accordance with claim 35, wherein said first SPVC bundle manager is further adapted to associate each of the member SPVCs with an Internet Protocol (IP) precedence level.

41. The system in accordance with claim 35, wherein said first signaling module transmits the SPVC setup message containing the SPVC bundle information to the second signaling module using the Generic Application Transport information element (GAT IE).

42. The system in accordance with claim 35, wherein said source network device further comprises:

a first connection manager coupled to said first SPVC bundle manager, adapted to allocate a PVC connection and an SVC connection on said source network device for each member SPVC.

43. The system in accordance with claim 35, wherein said destination network device further comprises:

a second connection manager coupled to said second SPVC bundle manager, adapted to allocate a PVC connection and an SVC connection on said destination network device for each member SPVC.

44. An Apparatus for creating a bundle of soft permanent virtual circuits (SPVCs) coupling form a source end to a destination end via a communications network, said apparatus comprising:

means for creating an SPVC bundle for the source end, the SPVC bundle comprising a plurality of member SPVCs, each member SPVC comprising a permanent virtual circuit (PVC) and a switched virtual circuit (SVC), each of the member SPVCs

being associated with a respective connection characteristic and coupling to a same destination; and

means for transmitting, from the source end to the destination end, an SPVC setup message containing configuration information of the SPVC bundle.

45. The apparatus in accordance with claim 44, further comprising:  
means for receiving parameters defining the SPVC bundle at the source end, the configuration information transmitted to the destination end corresponding to the parameters.

46. The apparatus in accordance with claim 44, wherein the configuration information comprises:  
bundle-level parameters; and  
parameters for individual member SPVCs.

47. The apparatus in accordance with claim 44, further comprising:  
means for associating each of the member SPVCs with a respective Internet Protocol (IP) precedence level.

48. The apparatus in accordance with claim 44, wherein said means for transmitting comprising:  
means for signaling the SPVC setup message containing the SPVC bundle information using the Generic Application Transport information element (GAT IE).

49. A apparatus for creating, at a destination end, a bundle of soft permanent virtual circuits (SPVCs) coupling form a source end to the destination end via a communications network, said apparatus comprising:

means for receiving and decoding an SPVC setup message containing SPVC bundle information for creating an SPVC bundle coupled from a specified source end, the SPVC bundle comprising a plurality of member SPVCs, each of the member SPVC comprising a permanent virtual circuit (PVC) and a switched virtual circuit (SVC);

means for extracting parameters from the SPVC bundle information; and

means for creating the SPVC bundle based on the extracted parameters, each of the member SPVCs being associated with a respective connection characteristic and coupled from the specified source end.

50. The apparatus in accordance with claim 49, wherein the parameters comprising:

bundle-level parameters; and

parameters for individual member SPVCs.

51. The apparatus in accordance with claim 49, wherein the SPVC setup message containing the SPVC bundle information is transmitted using the Generic Application Transport information element (GAT IE).

52. The apparatus in accordance with claim 49, further comprising:  
means for allocating a PVC connection and an SVC connection on the destination network device for each member SPVC.

53. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform a method for creating a bundle of soft permanent virtual circuits (SPVCs) coupling form a source end to a destination end via a communications network, said method comprising:

creating an SPVC bundle for the source end, the SPVC bundle comprising a plurality of member SPVCs, each member SPVC comprising a permanent virtual circuit (PVC) and a switched virtual circuit (SVC), each of the member SPVCs being associated with a respective connection characteristic and coupling to a same destination; and  
transmitting, from the source end to the destination end, an SPVC setup message containing configuration information of the SPVC bundle.

54. The program storage device in accordance with claim 53, wherein said method further comprises:

receiving parameters defining the SPVC bundle at the source end, the configuration information transmitted to the destination end corresponding to the parameters.

55. The program storage device in accordance with claim 53, wherein the configuration information comprises:

bundle-level parameters; and  
parameters for individual member SPVCs.

56. The program storage device in accordance with claim 53, wherein said method further comprises:

associating each of the member SPVCs with a respective Internet Protocol (IP) precedence level.

57. The program storage device in accordance with claim 53, wherein said transmitting comprising:

signaling the SPVC setup message containing the SPVC bundle information using the Generic Application Transport information element (GAT IE).

58. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform a method for creating, at a destination network device, a bundle of soft permanent virtual circuits (SPVCs) coupling from a source network device to the destination network device via a communications network, said method comprising:

receiving and decoding an SPVC setup message containing SPVC bundle information for creating an SPVC bundle coupled from a specified source end, the SPVC bundle comprising a plurality of member SPVCs, each of the member SPVC comprising a permanent virtual circuit (PVC) and a switched virtual circuit (SVC);

extracting parameters from the SPVC bundle information; and

creating the SPVC bundle based on the extracted parameters, each of the member SPVCs being associated with a respective connection characteristic and coupled from the specified source end.

59. The program storage device in accordance with claim 58, wherein the parameters comprising:

bundle-level parameters; and  
parameters for individual member SPVCs.

60. The program storage device in accordance with claim 58, wherein the SPVC setup message containing the SPVC bundle information is transmitted using the Generic Application Transport information element (GAT IE).

61. The program storage device in accordance with claim 58, wherein said method further comprises:

allocating a PVC connection and an SVC connection on the destination network device for each member SPVC.